

IN THE CLAIMS:

1. (Currently Amended) A coated metallic implant comprising a metallic implant having a surface and an outer layer, wherein the outer layer comprises a bone analogous coating comprising a collagen matrix mineralized with a calcium phosphate phase which is adhered to said implant surface, wherein the mineralized collagen matrix is constructed in the form of layers, and each layer comprises a network of mineralized collagen fibrils, amorphous calcium phosphate clusters and crystalline hydroxyapatite.
2. (Previously presented) A coated metallic implant according to Claim 1, wherein the collagen matrix contains more than one layer.
3. (Previously presented) A coated metallic implant according to Claim 1, wherein the calcium phosphate phase of the matrix contains amorphous calcium phosphate ($\text{Ca}_9(\text{PO}_4)_6 \cdot n\text{H}_2\text{O}$), hydroxyapatite ($\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$), octacalcium phosphate ($\text{Ca}_8\text{H}_2(\text{PO}_4)_6 \cdot 5\text{H}_2\text{O}$), brushite ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$) or mixtures thereof.
4. (Previously presented) A coated metallic implant according to Claim 1, wherein the calcium phosphate phase is doped with fluoride, silver, magnesium or carbonate ions or combinations thereof.
5. (Previously presented) A coated metallic implant according to Claim 1, wherein the collagen is collagen of type I.
6. (Previously presented) A coated metallic implant according to Claim 1, wherein the collagen is a mixture of collagen of types I to III.

7. (Previously presented) A coated metallic implant according to Claim 1, wherein said coating further contains gelatin.

8. (Previously presented) A coated metallic implant according to Claim 1, further containing growth factors, peptide sequences, hormones, antibiotics or mixtures thereof.

9. (Cancelled)

10. (Previously presented) A coated metallic implant according to Claim 1, wherein the metallic implant is made of titanium or titanium alloy.

11. (Previously presented) A coated metallic implant according to claim 1, wherein said coated metallic implant is prepared by the process comprising:

- 1) coating a metallic implant material by immersion in a collagen solution at a pH of less than 8 and a temperature 4 - 40°C, and
- 2) coating said metallic implant material with a calcium phosphate phase (CPP) in an electrochemically assisted process by means of galvanostatic polarization in an electrolyte solution comprising calcium ions and phosphate ions,

wherein process steps a) and b) are performed simultaneously or sequentially.

12. (Withdrawn) A coated metallic implant according to Claim 11, wherein an additional process step b) is placed in front of process step a).

13. (Withdrawn) A coated metallic implant according to Claim 11, wherein the process steps a) and b) proceed alternately a number of times.

14. (Withdrawn) A coated metallic implant according to Claim 11, wherein the process steps a) and b) are combined into one step, the metallic implant material to be coated being electrochemically polarized cathodically in a collagen solution comprising calcium ions and phosphate ions.
15. (Withdrawn) A coated metallic implant according to Claim 11, wherein a cathodic current flow of -0.2 to -50 mA/cm^2 flows for 25 to 40 minutes during the galvanostatic polarization in process step b).
16. (Withdrawn) A coated metallic implant according to Claims 11, wherein the mineralised collagen matrix is layered.
17. (Withdrawn) A coated metallic implant according to Claims 11, wherein the coating further comprises gelatin.
18. (Withdrawn) A coated metallic implant according to Claim 11, wherein a cathodic current flow of -0.5 to -30 mA/cm^2 flows for 30 to 40 minutes during the galvanostatic polarization in process step b).
19. (Withdrawn) A coated metallic implant according to Claim 11, wherein a cathodic current flow of -1 to -10 mA/cm^2 flows during the galvanostatic polarization in process step b).
20. (Cancelled)
21. (Previously presented) A coated metallic implant according to Claim 1, wherein the outer layer is 0.04-150 nm thick.
22. (Cancelled)

23. (Previously presented) A coated metallic implant according to Claim 2, wherein the metallic implant is made of titanium or titanium alloy.
24. (Previously presented) A coated metallic implant according to Claim 1, wherein the outer layer is 0.04-150 nm thick and the calcium phosphate phase contains crystals from 300-500 nm in length and from 50-60 nm in diameter.
25. (Previously presented) A coated metallic implant according to Claim 24, wherein the metallic implant is made of titanium or titanium alloy.
26. (Previously presented) A coated metallic implant comprising a metallic implant and a coating made of a collagen matrix mineralized with a calcium phosphate phase
wherein the calcium phosphate phase is doped with fluoride, silver, magnesium or carbonate ions or combinations thereof and
the collagen is a mixture of collagen of types I to III.
27. (Previously presented) A coated metallic implant according to Claim 1, wherein the coating is obtained by precipitating calcium phosphate from a solution in the presence of collagen.